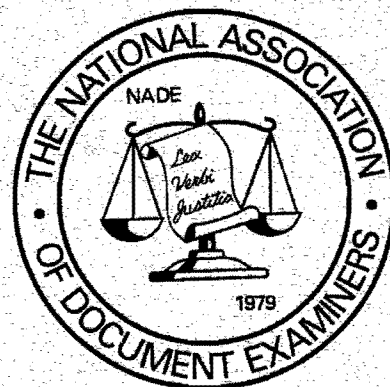


# **Journal of The National Association of Document Examiners**

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## **ARTICLES:**

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**Forensically Speaking by Phyllis Cook, B.S., BCDE, Diplomate**



# **JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS**

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# **JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS**

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## Editorial

Recently, as part of a demographic survey attached to a pilot test covering knowledge in the field of forensic document examination, I was asked what percentage of my work consisted of handwriting examination, typewriting and print process examination, ink and paper examination, etc. I gave the figure of 80% for handwriting examination. I suspect that had I been asked this question ten years ago I would have stated a higher percentage for handwriting examinations.

This shift that I have seen in the type of problem submitted for examination may or may not be reflected in your caseload. Many examiners prefer to refer non-handwriting problems to other examiners. But what differentiates a "document examiner" from a "handwriting examination expert" is the examination of much more than handwriting on a document.

At a recent conference, six NADE members had the opportunity to take a pilot test of a test that soon will be submitted to the Forensic Specialties Accreditation Board for approval under their standards and guidelines. It is likely that the day will come when the courts will want to know that a forensic expert has passed a test that has been approved by FSAB as one benchmark for qualification in the courtroom.

Part of the construction of the test was the identification of nine areas of knowledge that should be in the repertoire of forensic document examiners. Those areas, which are

not weighted equally, are: foundation skills, gathering evidence, analyzing handwriting, analyzing falsified documents, analyzing features of paper and media, analyzing impact and non-impact images, using lab instruments, evaluating evidence and presenting case findings, and knowledge of legal procedures.

As editors of the NADE Journal, we work to provide a mix of articles that is representative of these categories, and of the trend we see toward more diverse and complex examinations. Some of our articles are solicited, and others come to us as gifts from our members. In this issue we have three articles and a case note related to handwriting. On the technical side, we have articles and case notes on indented writing development, restoration of faded writing, uncovering covered writing, print process identification, and fingerprints on documents.

We hope you will find this and every issue of the Journal valuable, and these articles a springboard to further reading in this ever-expanding field of forensic document examination.

Emily Will, M.A., CDE  
Editor



## THE IMPORTANCE OF INTER-COMPARISON OF STANDARDS AS A FIRST STEP IN A SIGNATURE OR HANDWRITING COMPARISON

by  
Renate Griffiths, CDE

### Introduction

A preliminary examination of all available specimen material is an essential first step in a signature or handwriting comparison. Inter-comparison of signatures and handwriting is not frequently referenced in the literature except for Albert S. Osborn in *Questioned Document Problems*<sup>1</sup> and Wilson R. Harrison who states in his book *Suspect Documents: Their Scientific Examination*<sup>2</sup> (p. 436):

"Where standard or comparison handwriting is concerned, whether in the form of signatures or letters, the first essential is that the comparison material be reliable. The risk of including among comparison writings only a single specimen of handwriting not written by the person to whom it is attributed should never be taken, for the inclusion of a false standard of comparison may very well invalidate any conclusion based on this faulty material."

Reliable comparison material is paramount to a correct determination of authorship. One must avoid inclusion of false standards which may skew and ultimately invalidate an opinion.

Inter-comparison of all the available standards will identify any questionable material that has been submitted for examination and comparison. It is particularly important in an examination of signatures.

The purpose of obtaining as large a collection of specimen signatures as possible is to establish the range of the writer's natural variation. As is generally accepted, the standards should be contemporaneous to the date of the questioned signature or other handwriting material. Any unusual circumstances pertaining to the writer, such as injury to the hand, general health or other pertinent changes that may have affected the writing, should be noted.

Any unexplained aberration, especially in a signature, should be questioned and verified before proceeding further with the examination.

### Case 1

Two signatures of a Japanese businessman, one on each of two contracts, were questioned as to their authenticity. Twenty-seven specimen signatures were submitted for comparison. (Illustration Ia and Ib)

Signatures submitted as specimen signatures on documents K23 and K27 required verification and were confirmed, in Discovery, to have been written by the writer of the specimen signatures.

A document examiner acting for the defense gave the opinion that there was a strong probability that the writer did not execute the writing of the questioned signatures. He based his conclusion on differences in "the structures

<sup>1</sup> Osborn, Albert S., *Questioned Document Problems*. 2<sup>nd</sup> ed., revised (Albany: Boyd Printing Co. 1946)

<sup>2</sup> Harrison, Wilson, *Suspect Documents: Their Scientific Examination* (Chicago: Nelson-Hall Publishers, reprint of the 1958 ed.) pg. 436.



of the upper case letter 'K', lower loops of letters 'z' and 'y', lower case letters 'k' and 's' and upper case 'T', the speed of writing and blunt starting and ending strokes".

Verification of specimen signatures on documents K23 and K27 as authentic not only prevented the judge from believing another writer had written the questioned signatures but also removed the cross-examiner's ability to confront the client's document examiner, acting for the plaintiff, on what were merely pictorial differences and part of the writer's range of natural variation. In addition, fluent line quality without tremor or hesitation and good internal consistency clearly established that the questioned signatures were authentic.

This case was a good example of how serious mistakes were avoided by following a careful, preliminary screening process using inter-comparison of the specimen material. The case was judged in favor of the plaintiff.

## Case 2

The case involved a contested will. The writer, from the Netherlands and now deceased, was comparatively uneducated and neither spoke nor wrote English well. The will was a photocopy so that its examination relied on letter forms, spacing and arrangement without benefit of microscopic examination for line quality, writing pressure, indentation, ink differentiation, erasures or other aberrations.

Most of the specimen signatures were originals. The questionable specimen signatures on documents K18 and K19 were originals; those on documents K20, K21 and K22 were on carbon copies. (Illustration II)

Inter-comparison revealed:

1. Significant similarities among the specimen signatures on documents K1-a through K17.

2. Significant differences between specimen signatures on documents K1-a through K17 and signatures submitted as specimen signatures on documents K18 and K19 (originals), together with no combination of significant similarities.

3. Significant differences between the specimen signatures on documents K1-a through K17 and signatures submitted as specimen signatures on documents K20, 21 and K22 (carbon copies), together with some pictorial similarities but no combination of significant similarities.

4. The specimen signatures on documents K18, K19, K20, K21 and K22 were different and unverified. They were therefore rejected as part of the specimen pool. No attempt to verify these signatures was made because the documents themselves were deemed to be fraudulent.

The report was qualified based on examination of a photocopy of the will. The opinion was:

1. The writer of the specimen signatures on documents K1 through K17 did not write the questioned signature on document Q1.

2. The writer who wrote the specimen signatures on documents K1-a through K17 did not write the specimen signature on documents K18 and K19.



3. It is highly probable that the writer who wrote the specimen signatures on documents K1-a through K17 did not write the signatures on documents K20, K21 and K22.

After submission of the report the examiner was informed that the three carbon copies bearing signatures on documents K20, K21 and K22 on Child Care Claim forms were probably written by the testator's girlfriend. It was alleged that she was using his name to operate a day care facility and may have made false claims, including forging his name. The case was settled out of court.

If the five (5) signatures, K18, K19, K20, K21 and K22 that were rejected had been included in the specimen pool, the opinion could have been made mistakenly that the questioned signature on document Q1 was genuine.

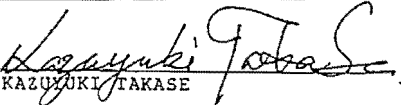

### **Conclusion**

Inter-comparison of signatures and handwriting cannot be over-emphasized and should be employed routinely by the document examiner in any examination and comparison. The two cases cited illustrate the importance of utilizing this procedure as a first step to avoid inclusion of false standards leading to an incorrect opinion.

*Renate Griffiths has been a Certified Document Examiner since 1992. She is past Chairman of the Certification Committee of the National Association of Document Examiners (1995-1998). Owner and operator of Griffiths & Associates in Vancouver, B.C., Canada, she has been practicing as a forensic document examiner since 1986. She has given expert witness testimony in court, arbitrations and depositions, lectured on Handwriting Identification to professional groups and written articles for the NADE Journal and The Advocate.*


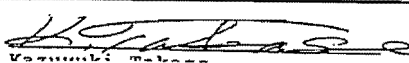
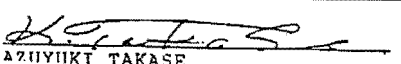
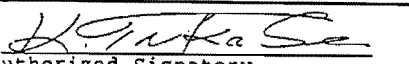
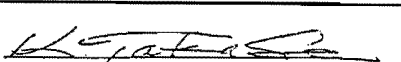
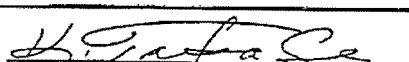
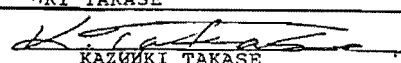
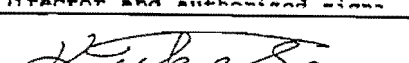
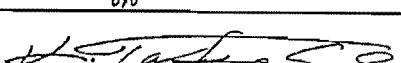
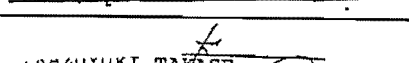
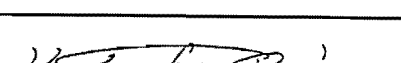

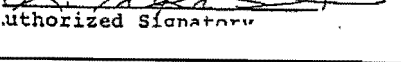


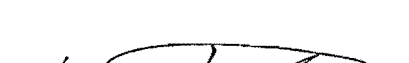

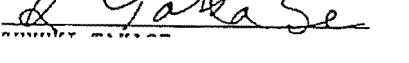
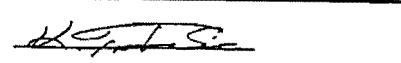


### Illustration I-a QUESTIONED

Q1 1987	 KAZUYUKI TAKASE
Q2 1987	 KAZUYUKI TAKASE

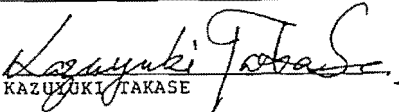
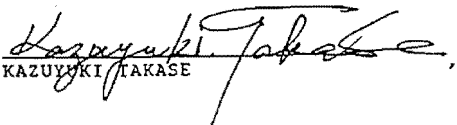
### KNOWN

#### REPRESENTATIVE SAMPLES

K1 1988	 KAZUYUKI TAKASE	K14 1988	 KAZUYUKI TAKASE
K2 1987	 KAZUYUKI TAKASE	K15 1988	 Authorized Signatory
K5 UNDATED	 KAZUYUKI TAKASE	K18 1988	 Director and Authorized Signatory
K6 1988	 KAZUYUKI TAKASE JYO	K19 1991	 KAZUYUKI TAKASE
K7 1988	 KAZUYUKI TAKASE	K23 1986	 KAZUYUKI TAKASE
K8 UNDATED	 Authorized Signatory	K24 1988	 KAZUYUKI TAKASE
K9 1988	 KAZUYUKI TAKASE	K25 1988	 KAZUYUKI TAKASE
K11 1988	 Takase, President	K26 UNDATED	 TAKASE
K12 1988	 KAZUYUKI TAKASE	K27 1985	 K. Takase, President
K13 1987	 K. Takase		


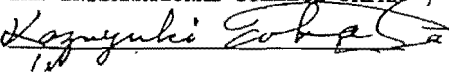
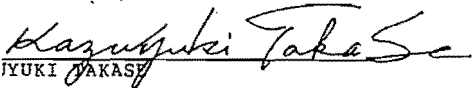
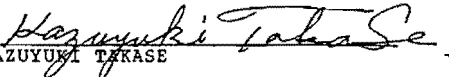



**Illustration I-b**  
**QUESTIONED**

<b>QDI</b> 1987	 KAZUYUKI TAKASE
<b>QD2</b> 1987	 KAZUYUKI TAKASE


**KNOWN**

REPRESENTATIVE SAMPLES

<b>K10 a)</b> 1991	 KAZUYUKI TAKASE
<b>K10 b)</b> 1991	DIAN INTERNATIONAL COLLEGE JAPAN 
<b>K20</b> 1987	 KAZUYUKI TAKASE
<b>K21</b> 1987	 KAZUYUKI TAKASE
<b>K22</b> 1987	 KAZUYUKI TAKASE



## Illustration II QUESTIONED

<b>Q1</b> Jan. 27/00	
-------------------------	--

## KNOWN

### REPRESENTATIVE SAMPLES

<b>K1-a</b> Aug. 22/00		<b>K11</b> Dec. 8/89	
<b>K1-b</b> Aug. 22/00		<b>K12-a</b> Mar. 16/82	
<b>K2-a</b> Aug. 22/00		<b>K12-b</b> Mar. 16/82	
<b>K2-b</b> Aug. 22/00		<b>K13</b> undated	
<b>K3</b> Aug. 23/99		<b>K17</b> undated	
<b>K6</b> Jan. 31/96		<b>K18</b> Aug. 11/00	
<b>K7</b> Feb. 1/96		<b>K19</b> Aug. 11/00	
<b>K8</b> Feb. 10/96		<b>K20</b> Jan. 26/00	
<b>K9</b> May 23/95		<b>K21</b> Feb. 18/00	
<b>K10</b> Sept. 4/94		<b>K22</b> Mar. 29/00	



## THE EXAMINATION OF DOCUMENTS FOR INDENTED IMPRESSIONS

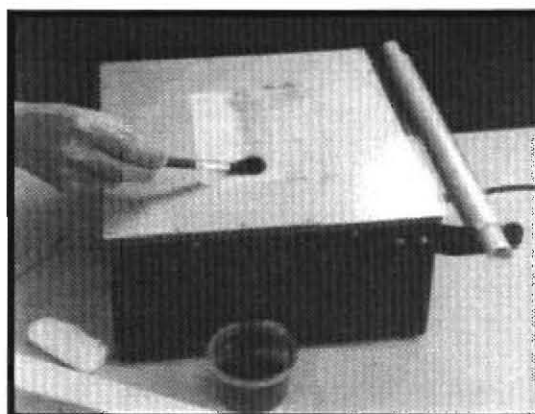
by  
Derek Aves

There are various items of equipment available to the forensic document examiner that can assist, for example, in the comparison of handwriting, the interpretation of information held on typewriter ribbons, or the examination of inks used on a document. There are also various magnifiers, microscopes and image enhancement systems - all used to make clearer what can be seen already with the naked eye. However there is also equipment available that develops indented impressions, which are not normally visible.

There are several ways to examine indented writing, and it is sometimes necessary to employ more than one technique. In the case of a document where the indented writing can

be seen, albeit not read very clearly, one of the best and easiest methods is to use an oblique light source to 'cast shadows' and to photograph the results. If this does not give a satisfactory result, there are other methods available.

In the Summer 2001 issue of The NADE Journal, J. Wright Leonard, CDE described the use of a scanner to reveal indented writing on heavy paper stocks. Attendees of the 2001 NADE conference held in the U.K. saw a presentation by Reed Hayes, CDE of Hawaii regarding the use of flatbed digital scanners to reveal indented writing. Marcel Matley, CDE of California demonstrated how the "Kinderprint" was used to develop indented writing, leading to proof of fraud. John Gargett, of Limbic Systems, Inc. showed a case in which indented writing was revealed by use of the MICS (Measurement of Internal Consistency Software) computer software supplied by that company.



*Illustration 1 - The apparatus on the left is the ESDA, and the one on the right is the Kinderprint.*



In addition to these methods, there are two pieces of equipment which are similar to each other and, over the years, have given some outstanding results.

The ESDA (Electrostatic Document Apparatus) was developed and produced by Messrs. Foster & Freeman in the U.K. A similar piece of equipment is the Vacuum Box IW manufactured by Kjell Carlsson Innovation in Sweden. The aforementioned Kinderprint (manufactured by Kinderprint, Inc.) is another device of this type.

In each case the document to be examined is placed onto the plate that forms the bed of the machine. When the pump is switched on, the document is sucked down tight onto the plate, which is covered with tiny holes to allow air to pass. There is a vacuum pump under the plate.

The machine carries a roll of Mylar film, similar to domestic cling film. The film is stretched out over the document and is held tightly onto it by the vacuum pump. An electrical charge is applied to the document, and a developer consisting of microscopic beads covered with toner is attracted to the indented areas. The accumulation of toner in the indented areas against the lighter colored background of the document can reveal indented writing.

The main difference between the ESDA and the Vacuum Box is that with the ESDA, the developer can be gently poured over the document (the plate has a hinged lid to allow the powder to run across the document), or with the use of a hood, it can be sprayed over the document as a fine powder. With the

Vacuum Box IW the powder can be brushed onto the document or allowed to fall gently onto it to reveal the indentations. The results can be kept as permanent records by being lifted onto a clear adhesive sheet. Two major features of this type of examination are that no damage is caused to the document, and the test can be repeated as many times as required. Improved clarity of results can be obtained by varying conditions, such as humidity, of the examination.

It should be borne in mind that, in common with other techniques, indented writing on a document may not "prove the case" but almost certainly will be of some value to those investigating a possible fraud. For example, it may reveal telephone numbers or addresses which investigators may find useful.

Where a signature is suspected of having been traced it sometimes is possible to reveal impressions from the tracing within the signature. However, care must be taken in the interpretation of the results as the "guide lines" found in the signature may be stray indentations from the pen used, particularly if a defective ball point pen has been used to write the signature.

Care also has to be taken in interpreting the results as not all characters, or parts of characters, are transferred. For example, a number 7 on the original writing may appear as "7" or as "-" on the indented "lift" if varied pen pressure has been used to write the number.

The ESDA does not reveal deep impressions very well. When the indented writing can be



seen fairly clearly, it may not be possible to get a very good result; however, it is excellent for revealing very faint writing otherwise invisible to the naked eye. In fact, it is so good that impressions can often be revealed from several pages below the original and not just the one being examined. In laboratory conditions, indented writings 12 layers below the original have been developed. This can lead to problems in actually reading the indented writing if there is a lot of overlap; however, with practice it usually is possible to distinguish between the different pages if there are not too many involved.

Insurance fraud cases often have been solved as a result of development of indented writing. An insurance contract relies on "utmost good faith" between the insured and the insurer; however many people still attempt to commit fraud, especially with the alteration of receipts, which are either invented or changed to claim a higher settlement figure.

In insurance claims relating to liability resulting from road accidents, a third party will often present receipts for taxi fares during the time a car is being repaired. These fares often will be paid by one of the insurance companies involved, but the system is open to abuse. Indented writing on the receipts produced may show that the receipts have not been written out in the correct chronological order. Or, the writing may confirm that they have, but no other receipts had been issued to any one else.

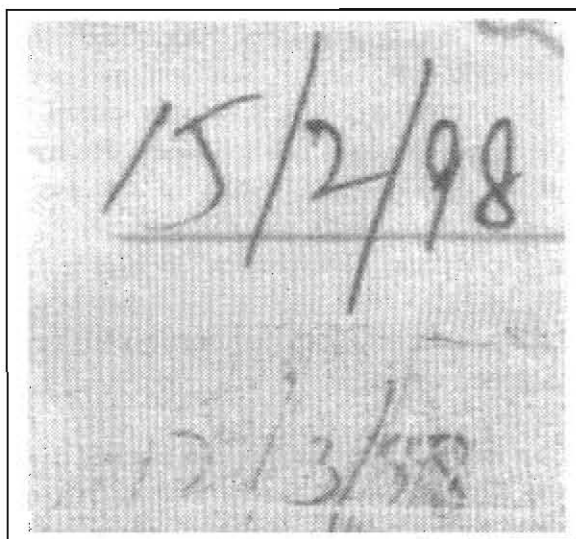
Surely the taxi driver would soon go out of business if he relied on only one customer!

In another scenario more than one taxi firm has been used, but the claimant must explain

why the writing of a receipt from one company is indented upon the receipt from another.

A claim may be submitted to an insurance company without any supporting documents. The claimant may resort to obtaining false documents, but in doing so, he may provide the insurance company with incriminating evidence.

For example, a person submitted a claim for some expensive Indian fabric and produced an invoice that indicated a date of 15th February 1998 (the exact date in this case was important to connect with travel arrangements). Indented writing on the invoice indicated that the previous invoice had been issued on 12th March 1998. It was later established that the insured had traveled to India in March and not February as stated, and then arranged for the invoice to be backdated.

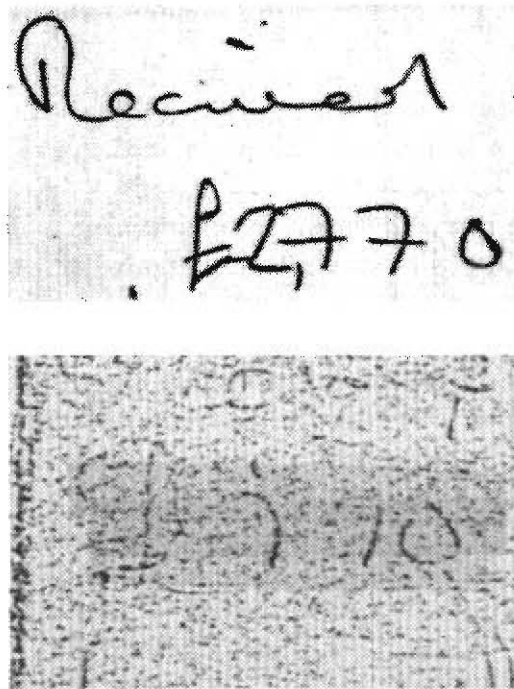


*Illustration 2 – On top is the date from the “February” receipt. Beneath is the March receipt showing indentations from the writing of the alleged February receipt.*



In motor insurance claims it is fairly common for purchase receipts to be written out twice - one copy for the buyer and one kept by the seller of the vehicle. To find indented writing on a receipt which suggests that it has been written out twice does not usually cause any problems, but then sometimes it does.

In another example a claim was submitted following the theft of a vehicle, and a purchase receipt was produced indicating a purchase price of £ 2,770. When examined the figures did not look right because the figure 2

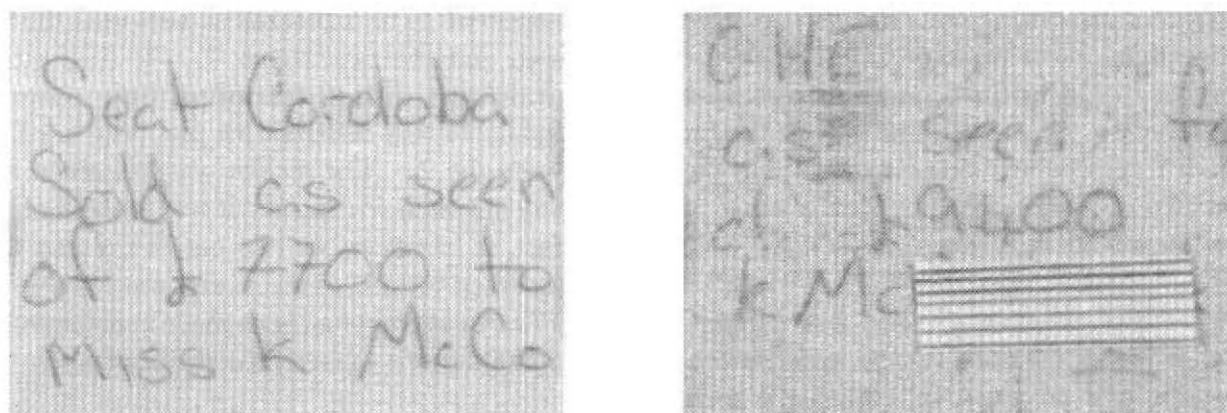


*Illustration 3 - The receipt (above) was suspicious due to the spacing of the digits. The "2" was found to be written in a second ink, and indented writing for the lesser amount was discovered as shown in the ESDA result (below).*

appeared to be squeezed in between the £ sign and the first figure 7. In fact, other techniques using controlled light sources indicated that different ink had been used to write the 2. The receipt was examined for any indented writing and it was found that, in fact, it had been written out twice, and the indented version of the receipt was for only £ 770. An attempt had been made at obtaining a £ 2,000 profit - just by the stroke of a pen.

Again, a vehicle involved in an accident received severe damage. The wreck was bought by a person who subsequently submitted an insurance claim, asserting that the vehicle, which had by then allegedly been fully repaired, had been stolen. The insured was unable to provide proof of the repairs as the vehicle had been purchased after the repairs had been carried out. A purchase receipt was produced, although as is often the case, the "seller" gave a false name and address. The receipt was for £ 7700 - which was about the correct price for the age and type of vehicle. When the receipt was examined, it indicated that, as before, the receipt had been written out twice, but the first time it was for £ 9400, which was far more than the car would have been worth. When investigators re-interviewed the insured, the claimant admitted that he had bought the wrecked vehicle, it had never been repaired, and he had initially guessed that had it been repaired it would be worth £ 9400. It was only when an accomplice pointed out that £ 9400 was too expensive and a claim for this figure would alert the insurance company that he re-wrote the receipt for £ 7700. See Illustration 4.





*Illustration 4 – When an ESDA was performed on the submitted receipt (left) indentation evidence indicated that the receipt had been written out previously for a higher amount, as shown in the ESDA result (right).*

The majority of cases submitted for examination in insurance matters, in fact, may not have anything wrong with them. This appeared to be the case where a purchase receipt was submitted in support of a claim. The investigators were “not happy” with the claim but could not substantiate their suspicions. A cursory handwriting examination was made of the receipt to compare it with the claim form in case the insured had written it out himself. As can be seen in Illustration 5, the writing did not match. When the receipt was examined for any indented impressions, it revealed that it had been written twice, but in different handwriting! The results of the comparison with the indented writing on the claim form resulted in another fraudulent claim repudiated by the insurance company! The insured wrote out the wording of the receipt for someone else to copy in case the insurance company tried to compare the writing.

Impressions need not always be of writing. A letter which has been sent through the post

may reveal details of the franking marks made by Postal Authorities onto the envelope, revealing a date and place of posting. Documents supposedly originating in different places may show identical impressions where they have had past contact.

Finally, here are two examples suggesting caution by both the document examiner and the original writer. In the U.K., with the odd exception, motor vehicles over three years old must be submitted for an annual mechanical examination. If the vehicle passes the examination, a Test Certificate is issued.

In insurance cases the companies always ask for the certificate to be produced to them, which obviously causes a problem if one has not been issued or if the vehicle failed its test. This is one reason why there is a lucrative trade in counterfeit and stolen certificates. If an insurance company receives what is believed to be either a counterfeit or stolen certificate, it can be submitted for examination.



Motor insurance refused or cancelled or special terms imposed

---

SINGLE

YR 1600-2000 cc 0000-  
1 CPG No. of doors: 5 Mileage: 43,000

MS Date of purchase: 4th APRIL 1997

PRIVATE DEALER Estimated current value: £8,500

6000 Bought by: MYSELF

APRIL 1997

\* BLUE STRIPE ON SIDES

1 Not been modified

OWNER

STREET KEPPER

older named above, as/\_\_\_\_\_ the MAIN USER of this vehicle

21

1

Notes, the Registered Keeper or the Main User of the vehicle, please give details.

Receipt      9-10/6/1967  
 FOR SALE OF FORD  
 TRANSIT 1.6L TAD  
 LUTON, Luton Van

Receipt  
 16 APRIL 1997  
 FOR SALE OF FORD TRANSIT  
 HIGH TOP LWB USDM VIN  
 2IG 001 [REDACTED]  
 FOR THE SUM OF £4600  
 PAID WITH [REDACTED]

*Illustration 5 – On the upper left is the questioned claim form. To the right is the receipt, and to the lower left is the ESDA result from the claim form.*

In one particular case an examination revealed the writing: "Tony, here is the forged certificate that you wanted" with the insured's name being Anthony S. It looked as if there was evidence of his guilty knowledge until it was disclosed that the insurance company's claims manager's name was "Tony," and the writing was from one of his claims handlers. Clearly it is important to check the validity of information found as indented writing before concluding that it is an indication of fraud.

In the second case the insurance company suspected that an insured had some previous motoring convictions that had not been disclosed to them. U.K. insurers do not take

very kindly to people who deliberately evade giving important information, but insurers are unable to obtain details of anyone's convictions without their permission. The investigator appointed by the insurance company tried to obtain an admission from the insured that there had been serious motoring convictions, but the insured would not admit to them and was obviously keen to cover up the fact and upset at being questioned about it.

The insured also made a written statement denying having any motoring convictions. The insurance company later received a letter from the insured stating that all further communication was to be through a solicitor.



When the letter was examined for any indented writing it revealed that on the page above the letter to the insurance company the insured, in fact, had written to the solicitor asking him to deal with the claim. Unfortunately for the insured, indented examination revealed the sentence: "I have not told the insurance company about my convictions." The moral of the story? Be careful what you write - and where you write it - someone may be looking for indented writing!

With acknowledgments to: ACO Electronics Limited, (Kjell Carlsson Innovation), Unit 3 Manor Farm Business Park, Wendy, Royston, Hertfordshire SG8 0HW, United Kingdom, Tel: +44 (0) 1223 208 222.

Foster & Freeman Limited, (USA Office), 1333 Swan Drive, Annapolis, Maryland. USA 21401 – 5268, Tel: 888 445 5048

*Mr. Derek Aves was a police officer in the UK and spent years performing "Scenes of Crime Officer" duties. He then worked within the insurance industry investigating suspect household and motor claims. When his company began to specialize in the investigation of motor claims (accidents & thefts) in 1989, he was asked to set up a forensic document examination department to cope with a large number of suspect documents. In 1997 he left the company to launch his own business. Mr. Aves is a Certified Document Examiner through the National Association of Document Examiners, and is a member of the Association of British Investigators.*



## **IMAGE CHARACTERISTICS OF COMMON TRADITIONAL GRAPHIC ARTS PRINTING PROCESSES**

by  
Milton Pearson

**Abstract:** Photomicrographs of letterpress, gravure and lithographic images are given showing the most common identifying characteristics of these processes.

Two characteristics that clearly differentiate traditional printing processes from the modern digital non-impact processes are the use of a hard image carrier (printing plate or cylinder) and the splitting of an ink film in the transfer of the image onto a substrate. The printing plate separates the image from the non-image areas by either a physical relief, a raised image area in letterpress and a recessed image area in gravure or chemically on a planeographic surface in lithography. In the transfer from the printing plate to the substrate, the ink film split determines how much ink will be used to form the image and is a fixed amount for all contact areas between the plate and the substrate. In order to render images of different tonal values, the area of ink on the substrate must be varied as the ink split fixes the amount of ink transferred. This process is known as half toning and uses dots of ink of different sizes to produce different tones in the image, small dots for lighter tones and larger dots for darker tones.

In letterpress, the raised image area is inked and pressed against the substrate (usually paper) to transfer the image. The inking must be controlled so that only the raised image areas receive ink and not the lower non-image areas. A thick paste ink is used to stick to the

raised image areas. Where the two surfaces come together (printing plate or cylinder and paper) is known as the printing nip. A sufficient amount of pressure is applied in the printing nip to assure that good contact is made between the inked printing plate and the paper in order to achieve an accurate transfer of the image to the paper. The pressure used in the printing nip imparts two typical letterpress characteristics to the image. As the raised image area of the plate is pressed against the paper, there is a tendency to squeeze the ink to the edges of the image leaving a telltale border of ink around the image areas. Figure 1 shows this for images of text and Figure 2 shows this for halftone dots.

The second effect of the pressure in the printing nip is a possible embossing of the image areas (raised parts of the printing plate which contacts the paper) depending on the pressure used and the compressibility of the paper.

In gravure, the recessed image areas are flooded with ink by rotating the printing cylinder in a bath of very fluid ink. The non-image areas are wiped clean of ink by a wiping blade called a doctor blade. In order to keep the doctor blade from dipping into and wiping ink from the image areas, the image areas are divided into tiny cells, the walls of which are of the same height as the non-image areas. This prevents the doctor blade from dipping into the image areas. In the printing nip where the paper and printing cylinder come together it is the function of the paper to absorb the ink from the image cells. To assist this process, good contact must be made between the paper and the printing cylinder. A paper with a smooth surface is required.



Sufficient printing nip pressure is applied to aid in contact and ink transfer. If the image is text, the cell structure will all be of the same size and volume (depth of cell) and a fairly uniform amount of ink will be used in printing the text. However, the cell structure will show itself in the form of a serrated edge of the letters printed as shown in Figure 3. This is particularly true when the edge of the text is at an angle to the pattern of the cell structure. In the tonal areas of the image the cell volume may vary. The surface area of the cell will stay the same but the depth of the cell may vary, changing the volume of ink in order to transfer different amounts of ink. In some processes both the area of the cell as well as the volume are varied. However, not all of the ink is absorbed from the cells and this causes the printed dots to have a low-density center or hollow appearance as seen in Figure 4. As with letterpress, the raised area of the printing cylinder is pressed against the paper (in this case the non-image areas). If pressure in the printing nip is sufficient, possible embossing can occur in the non-image areas.

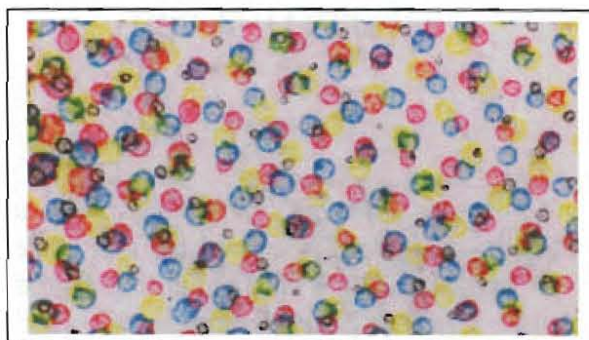
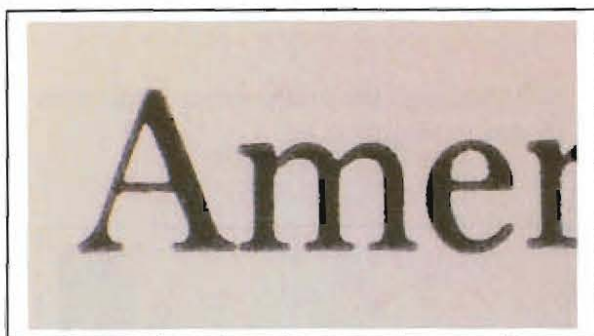
In lithography the surface of the printing plate is smooth and the image areas are separated from the non-image areas by chemical means, where the non-image areas are receptive to water and the image areas are receptive to oil-based inks. The printing plate is inked by first receiving a film of mostly water, but containing small concentrations of certain materials that aid in the protection of the non-image areas and improve the operation of the process. This solution, which is called fountain solution, covers the non-image areas, preventing the oil-based ink from transferring

to the non-image areas. When the plate is subjected to the oil-based ink, the ink will be repelled from the non-image areas and received by the image areas. The image is then printed onto an intermediate printing cylinder covered with a rubbery surface called a blanket. The blanket then prints the image onto the substrate, usually paper. So there are two printing nips in the lithographic process, plate to blanket and blanket to paper. As such, in lithography the printing plate never comes in direct contact with the substrate as in letterpress or gravure, giving rise to the term offset lithography.

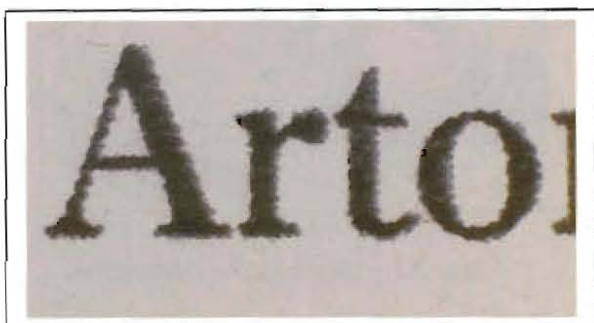
Because the printing blanket is a rubbery surface with some degree of compliance, it can conform well to various types of paper surfaces with minimum amounts of pressure. Therefore the pressure in the printing nips is lower than those needed in letterpress and gravure, and no embossing of the substrate or paper occurs. The results are images, both text and halftone dots that are of uniform density with clear, well defined edges as seen in Figures 5 and 6.

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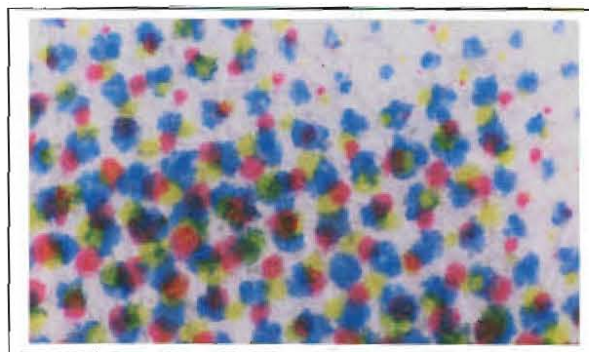




*Figures 1 and 2: Letterpress – The ink is squeezed to the edges of both the image and the halftone dots that form the image*



*Figures 3 and 4: Gravure – The edge of the image has a serrated appearance and the printed dots have a low-density center giving them a hollow appearance.*



*Figures 5 and 6: Lithography – Both text and dots have a uniform density with clear, well defined edges.*

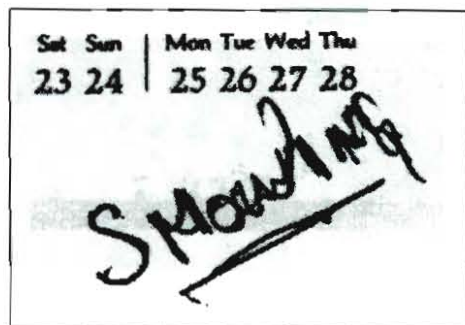


## DISPUTED SCRIPT

by  
Maureen Ward-Gandy, CDE, Diplomat

A business desk diary page dated February 7, 1991 containing suspect writing was presented for examination. The claimant believed that a word, "Snowing," was written over a clue to matters relating to an agreement in a land ownership dispute between two families. The defendant stated that the word "SNOWING" had been written in capital letters by his secretary when an appointment for that day had been cancelled due to snowy weather, and that he had later doodled over the word while talking on the phone. The specific task addressed in this article was the examination of the questioned writing to determine what was written originally under the word "Snowing". Other aspects of the examination are not discussed at this time.

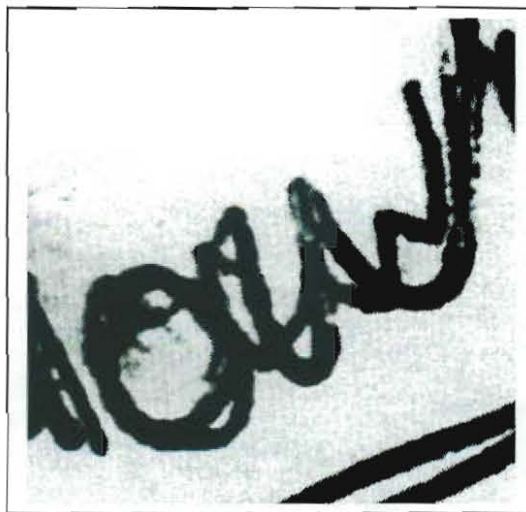
The questioned entry, shown in Figure 1, was an overwritten word. Three different examinations were carried out, and images from each examination help to illustrate the examiner's opinion.



*Figure 1 – from a desk diary*

First, the document was examined with a stereomicroscope, and photographs were

taken through the microscope eyepiece as shown in Figure 2.



*Figure 2 – through the microscope*

Next, the questioned entry was scanned as a grayscale image and then rendered using a recently introduced computer software program.<sup>1</sup> While the human eye can perceive only 30-50 shades of gray, a digital device can distinguish 256 shades of gray. This software assigns a numeric value from 1-256 to each pixel according to that pixel's shade of gray. The software then renders a 3 dimensional image of the scanned area by assigning a third dimension of height to each pixel equal to the gray scale number. Thus, darker (more dense) gray pixels will rise higher on the three dimensional view. To help the viewer perceive the information that can be obtained from such a view, the software also has the capability of mapping each shade of gray to a color; red is assigned to the highest numbers (most dense shades of gray) and blue is assigned to the lowest numbers (least dense shades of gray).



The image in Figure 3 is another way of illustrating the document examiner's opinion that the original writing under the word "snowing" is simply an earlier writing of the same word.

Additional examinations not covered in this article resulted in the opinion that one writer had indeed written the first version of "snowing" and that later another writer had overwritten the word – possibly as an innocent doodle while talking on the phone where this desk calendar was found.

The document was also examined using an ultraviolet and infra-red document examination system. This apparatus excites a document with various wavelengths of visible light, UV or IR, and shows the reactions of the materials on the document through various filters using a video camera.<sup>2</sup> Images can be captured and fed to a computer. In this instance, there are two different reactions to the exciting source, indicating the presence of two inks. Figure 4 is an image captured by the apparatus. One ink has an opaque reaction while the other ink has a fluorescent reaction.

One other inquiry made by the examiner in this case was directed towards the weather bureau in the area where the defendant's office is located. There really was a major snowstorm on the day of the questioned entry.

Sometimes it is possible to use more than one approach to answer a document question and

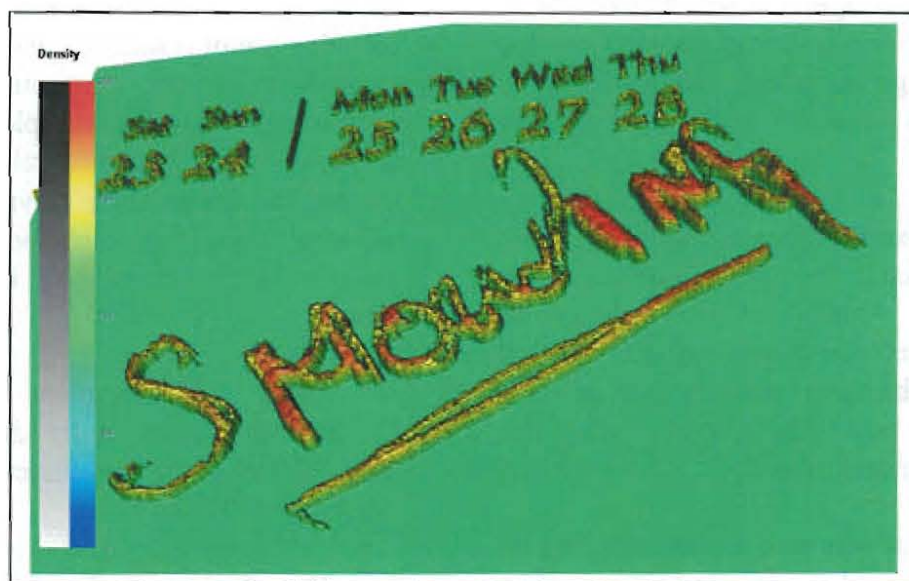
to illustrate that answer. It may take a combination of results to amass the evidence needed to answer a question. Also, the examiner can use the multiple examinations to check his or her own reliability and to present the information in various ways to viewers who may each be able to see information presented best in a particular format.

1. MICS (Measurement of Internal Consistencies) software by Limbic Systems, Inc., 725 North State Street, Bellingham, Washington 98225, USA

2. The device used was a QDX-430 manufactured by Aco Electronics, Ltd. Unit 3, Manor Farm Business Park, Wendy, Howston, Herts, SG8 0HW, England

*Maureen Ward-Gandy is a NADE certified forensic document examiner from the United Kingdom. She is a Diplomat of NADE, a Founding Member of the Expert Witness Institute, and a member of the Forensic Science Society in the UK. She has completed courses in Court Skills offered by Bond Solon and "Law" courses offered by the Expert Witness Institute. Ms. Ward-Gandy is a Single Joint Expert and has testified in the whole hierarchy of Britain's Law Courts. NADE members who attended the 2000 NADE conference in the UK enjoyed an excellent conference planned and hosted by Ms. Ward-Gandy and her family.*





*Figure 3 – A software-rendered image of the questioned entry. The red indicates the area of heavier density. A “threshold” value has been set blocking out the lower density values, which is why the “blues” representing the lower densities are not seen in this image.*



*Figure 4 – Different reaction to IR of two inks*



## DETERIORATED HANDWRITING: GENUINE OR FORGED?

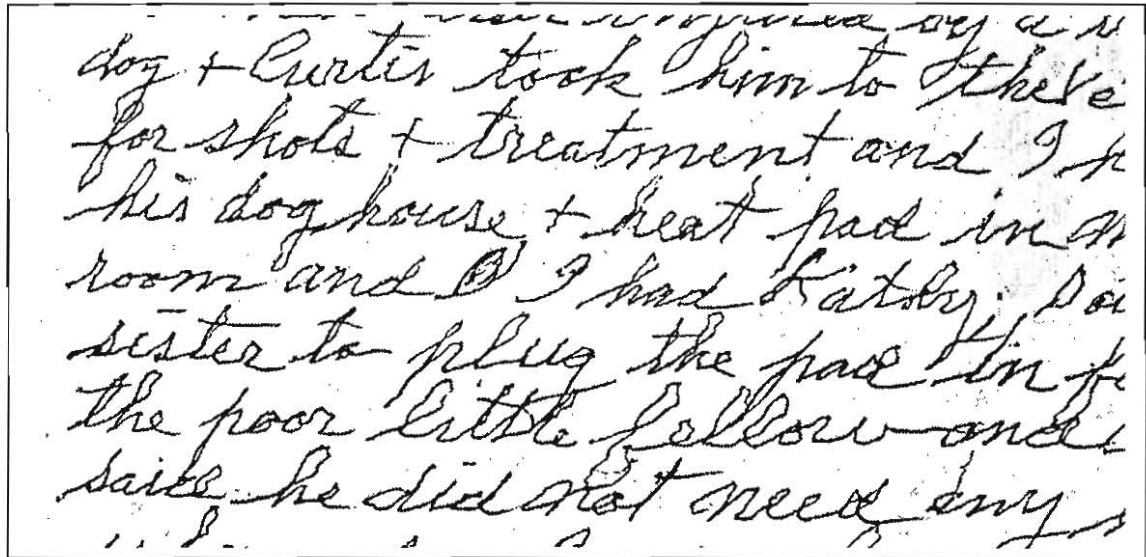
by

Jeanette L. Hunt, CDE

One of the most challenging problems questioned document examiners confront is to determine whether deteriorated handwriting is genuine or forged. Tremor is evident in many documents presented for handwriting examinations. This article will review the

writing of several prominent document examiners who discuss tremor and deteriorated handwriting.

Tremor is indicated by an involuntary, rhythmic and recurrent movement of the pen. These tremulous strokes are instant changes from the desired direction of the pen line and are attributed to nervous impulses affecting the muscles. (Baker)



*Illustration 1 – Genuine tremulous writing*

### Genuine Tremors

Some of the factors causing genuine tremor are:

1. Illness affecting the writing muscles
2. Weak writing muscles
3. Natural nervousness
4. Exertion
5. Intoxication
6. Shaking of the paper or its support during the writing process
7. Illiteracy or unfamiliarity with the script
8. Guided or assisted writing with consent of the writer

(Puri)



In genuine tremulous writing, some of the strokes may be free of tremor, while in simulated tremulous writing, the writer often makes the mistake of placing tremor in all lines. An individual who writes poorly often has a natural tremor in certain strokes, usually the upstrokes, while the down strokes are smooth. Natural tremor, as shown below, is difficult to simulate or copy. (Baker – p. 527, Osborn)

It is not uncommon for some people to have the “shakes” – slight tremors of the hands or head. Most of the time these “shakes” are accepted as part of the aging process. Chances are it is essential tremor, better known as ET, which affects an estimated 4 million people. It is the most prevalent movement disorder in the U.S. Although there is no cure, it is easily treatable, and it does not lead necessarily to Parkinson’s disease. (Modern Maturity, 1993)

Most often affecting the hands, at other times the head or the voice, ET worsens gradually. Tremors occur when the patient is using his or her hands for writing, eating or maintaining a certain position such as holding a glass with the arm extended. Fatigue and heightened emotion – good or bad – will aggravate symptoms. (Modern Maturity, 1993)

Beryl Gilbertson states in her article, Handwriting and Alcohol, “Spontaneously produced, cursive textual writing uses the full complexity of brain functioning which is programmed for handwriting, so can be expected to more truly show a writer’s degree of impairment, as compared with his signatures written at the same time.”

“A smooth ductus, together with slowed reactions while maintaining forward speed, resulting in larger and wider writing without marked tremor, but with a possible drooping of the baseline from mid-page onwards, gives good probability that a writing sample is being affected by alcoholic intoxication.”

“The most significant finding is that the alcohol-dependent person writes in a better organized, less tremulous fashion when he has had a few drinks, than he does when fully sober.”

Tremor is less pronounced when an individual writes with pencil, as opposed to pen. A pencil is held with a tighter grip to give the pressure required to allow the pencil to mark the paper. This grasp of the pencil in contact with the paper steadies the hand and reduces the tremor. (Baker – p. 349)

Involuntary tremors with fine line connections are seen often in the writing of people whose writing ability is declining due to loss of physical strength. These fine line connections are difficult to imitate because the imitator would have to have both the awareness of the features and the dexterity to duplicate them. Baker writes that genuine tremor consists of involuntary and inconsistent horizontal and vertical lines – often abrupt and zigzagging. Fraudulent tremor is often produced by someone whose method is to twist and turn the writing instrument. Spurious signatures can often be detected by close examination of these characteristics. (Baker, pp. 353-4)

Although writing shows tremor in the ductus,



there usually remains an inherent element peculiar to the writer that identifies the signature as genuine regardless of the tremor in every letter. Such peculiarities are apparent to the expert who uses them in distinguishing between the genuine and the fraudulent writing. (Baker, p. 351)

### Fraudulent Tremors

Some causes of fraudulent tremor are:

1. The forging process itself; although tremor may not be present in the model writing.
2. Imitation of tremor while forging a tremulous model.
3. Guided handwriting against the will of the writer.
4. Assisted handwriting against the will of the writer.
5. Inequality in movement at any place as evidenced by strong line quality combined with weak, hesitating line quality.
6. Frequent interruptions in movement, changes in speed or pen pressure. (Puri, Osborn)

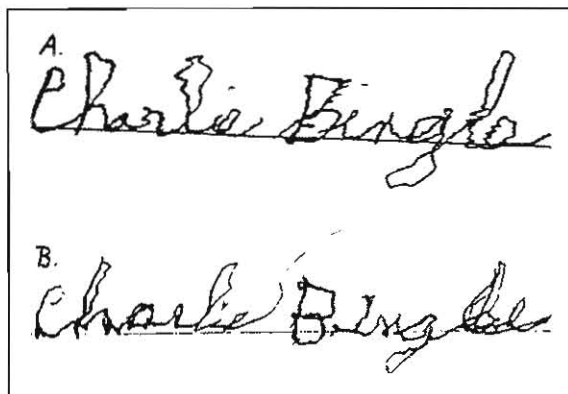


Illustration 2 - "A" is the non-genuine signature, and "B" is the genuine signature.

### Deteriorated Writing

A chronological arrangement of the writing can show signatures that display varying and fluctuating levels of deterioration. Factors affecting the production of such handwriting include physical strength, old age, muscle atrophy, medication, sitting position and illness, just to mention a few. The examiner's understanding of these problems is critical in determining the authenticity of such a deteriorated signature. (Hilton, #6)

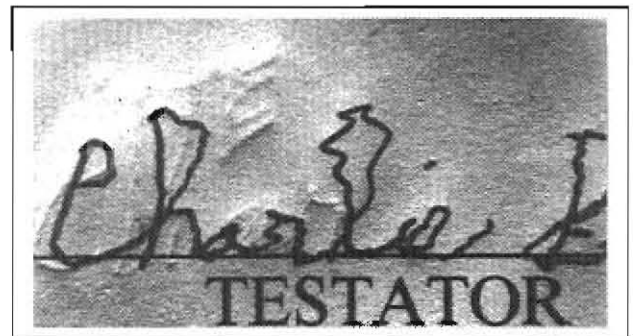


Illustration 3 - A closer look at "A" reveals indentations, evidence that the signature may have been produced in a tracing process.

While document examiners do not attempt to diagnose a problem or illness from the handwriting, they need to be aware of the effects that illness can have on the line quality. It may be important to gather medical information on the person to see whether it correlates with the observed handwriting characteristics.

A serious illness or old age affects the design features of the signature and the writing skill and quality. Irregular strokes, poorly formed



letters, poor alignment and irregular letter spacing are among the factors found in this class of writing.

Another characteristic frequently found in writing affected by age or illness is difficulty in starting a signature. There may be one or two false starts made up of weak, erratic strokes

that have no connection with the final signature. There also may be points within the signature or near the end where suddenly the movement is free and relaxed. (Hilton, #6, p. 181)

Handwriting is an acquired skill that involves muscular action and the individual's reflexes. Once the finely developed system of brain, nerve and muscle interaction involved in writing becomes weakened, the quality of writing will deteriorate. Aging involves a gradual decline of the body, which, in time, may affect the writing control system and consequently may lead to an inferior form of writing. (Hilton, #5, p.161)

Deterioration due to age is not a straight downward decline but rather a gradual decline that reaches a lower level of skill and writing ability. There will be, within the chronological pattern of deterioration, occasional signatures of better quality than those immediately before. There can be days of extremely poor writing, while on subsequent days there may be a return to an earlier skill of writing. Illness that affects the nervous system or muscular control can lead to a similar decline in the finely developed writing system. (Hilton, #5, pp. 161-62)

Advanced stages of blindness have a sharp influence on writing. The writing may

become larger, less accurately formed with baseline alignment becoming irregular and an inability to keep lines of writing carefully separated. With many physical handicaps there occurs a general deterioration in the writing, affecting the quality or smoothness of execution, the design of letters, baseline alignment, slant, and other identifying characteristics in some degree. With many types of illness the deterioration is temporary; when the person recovers his health, his writing resumes its former level of skill, as opposed to aging in which deterioration can only be reversed in small degrees for short periods of time. (Hilton, #5)

Usually, documentation of these conditions is difficult since a person seldom writes a great deal during periods of illness. One of the greatest difficulties in handling many of these writing problems is the lack of comparable writing standards executed during illness. (Hilton, #5, p.163)

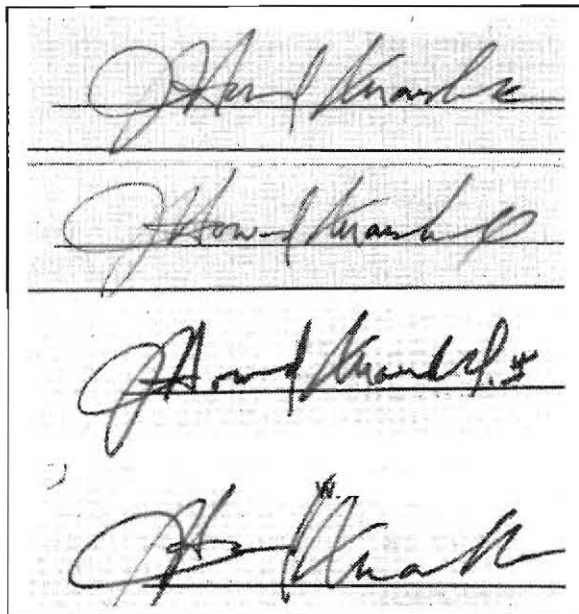
When age and illness affect the handwriting it becomes less coordinated, declining in skill, legibility, design and smoothness of execution. It develops uncertainty and lack of uniformity. With illness the decline often occurs very rapidly, but with aging it may be a gradual condition. It is important to understand that the decline in form and quality of execution are interrelated. (Hilton, #5, p.166)

To better understand this class of writing, we have to look at the faults of the more extreme examples.

1. Difficulty starting signature. May have one or more false starts.



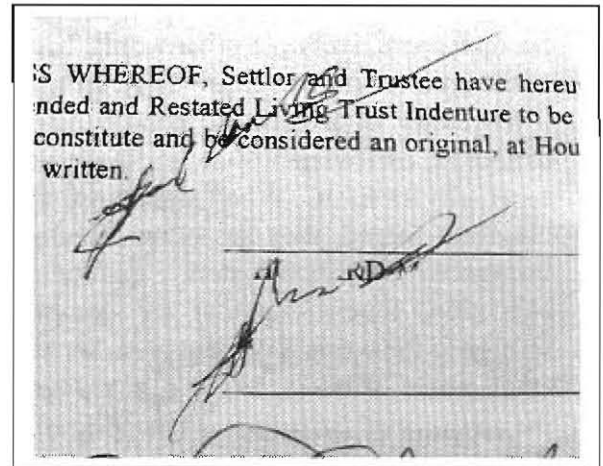
2. Uncontrolled impulses within the signature; a stroke moving off at an odd angle or direction that apparently is completely uncontrolled by the writer. Direction can be up, down, right or left.
3. Free release at the end of a segment of writing, which may occur within one name of a signature.
4. Irregularity in pen control in proportions of certain compound letters and with upper and lower proportions that can become erratic.
5. Letter forms go astray with occasional and often inaccurate effort to correct a defect.



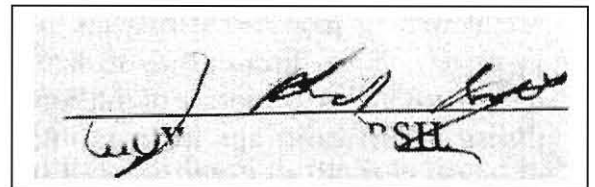
*Illustration 4 – Genuine signatures before visible onset of deterioration*

6. Slant in a deteriorated writing may be more vertical than before and can vary due to lack of control.

7. Deteriorated writing may still have change of pressures on upstrokes and down strokes.
8. Repetitions of letters or part of name omitted with no effort to correct the defect. (Hilton, #5, pp. 169-70)



*Illustration 5 – Deteriorated, but genuine signatures*



*Illustration 6 – Deteriorated, but genuine signature*

In some respects deteriorated writing may be more difficult to imitate than normal writing. The forger will attempt to make his writing product pictorially like its model. The uncontrolled, abrupt directional changes found in deteriorated writing are often unnaturally imitated with slower, less impulsive strokes, while the uncontrolled tremor of age may



become a more measured, uniformly controlled "tremor" in the forger's hand. These differences are subtle and may be difficult to analyze, and even more difficult to demonstrate to the layman, judge, or jury. (Hilton, #5, p.170)

As writing deteriorates, abnormal variables become more likely. In other words, because of the greater normal variation and the general low quality of execution, non-genuineness cannot be established by minor divergences, especially in form. When signatures of this class are forged, they are often detected by instances of inconsistent qualities of execution, letterforms that are completely foreign to the writer's present or earlier habits, or elements of the signature that are beyond the capacity of the writer at this point of life. (Hilton, #5, p. 171)

To handle problems of this class accurately, the document examiner needs to examine actual writing produced during the illness. However, if a deteriorated signature is questioned and no standards of the period of illness or advanced age are available, the examiner may still be able to judge whether it could be consistent with the writer's physical condition. Problems of this class involve special consideration and careful interpretation of the observed facts if document examiners are to reach accurate conclusions. (Hilton, #5, p.171)

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*Jeanette Hunt, CDE, has been a member of NADE since 1994 and has been a presenter at NADE seminars. In addition to managing her document examination business in San Antonio, Texas, Jeanette is a Certified Instructor for Texas Police Officers and also has completed specialized training in Statement Analysis.*



## DEVELOPMENT OF FINGERPRINTS ON DOCUMENTS

by

Barbara Downer, BA, CDE

The year 2001 marked the 100th anniversary of fingerprint development by Sir William Henry of Scotland Yard. Since that time, this process has played a valuable role in crime scene investigations as it relates directly to the primary objective of every criminal investigation – the identification of the offender. Forensic document examiners are most concerned with many aspects of fingerprints on documents.

There are two types of fingerprints found on documents, evident and latent. Evident fingerprints are those that are visible, as they have been placed on the document with blood, ink, grease, paint, dirt, etc. Latent fingerprints are those not visible, and they must be developed with the use of a chemical or other methods. This type of print is formed by the perspiration and oily matter from the sweat pores of the skin, which combines with any grease or dirt on the fingertips and is then absorbed into the paper.

If the document contains written or typewritten material that is an essential part of the investigation, the document first should be copied, photographed and examined by the document examiner before any attempt is made to develop fingerprints. Some fingerprint development processes may disturb or dissolve the handwriting on the document. Care should be taken to handle the document with tweezers or on the edges only, wearing cotton or latex gloves so any possible fingerprints are not damaged and no

additional fingerprints are placed on the paper.

Humidity can also affect fingerprints on paper. Because paper is a surface designed to absorb ink, it will also absorb moisture. Therefore, humidity can cause diffusion on the ridges of a fingerprint, smudging them or even causing them to disappear.

If there is a suspicion the document contains indentions, the ESDA test should be performed before any attempt at chemical development of fingerprints, as impressions will be lost after such a process.

When one thinks of developing latent fingerprints, the first thing that usually comes to mind is the common method of using finely ground carbon powder and a brush. While this method will work on hard, smooth or nonabsorbent surfaces, it is not an efficient method for an absorbent surface such as paper or cardboard. The exception might be glossy photographic paper or a similar paper. However, the development of latent prints on absorbent surfaces with fingerprint powder is usually unsuccessful and possibly may render the document unsuitable for any additional chemical processes. If this method does result in a print, it must be photographed for comparison purposes, as the print cannot be “lifted” off the paper using the traditional transparent acetate tape. Generally, this method is not recommended for paper surfaces.

Until the 1970s one of two classical methods to lift fingerprints from paper was iodine fuming. This method consists of placing



crystals of iodine in a fumer and then blowing into the fumer to create iodine vapors. The human breath is hot enough to transform the solid crystals into fumes. The vapor is aimed at the paper, which differentially absorbs into the debris of the print causing the ridge detail of the fingerprint to stand out in a short time. Since the image will also fade quickly, it must be photographed immediately. A second application can be applied if more photographs are necessary. The problem with iodine is that it is a kind of chlorine gas and is therefore highly toxic. The safest method for performing this process is in a vapor chamber where an ordinary light bulb provides the needed heat. This method, fortunately, is obsolete.

The other classic method for locating prints on paper is the use of silver nitrate. This method relies on the same principle that produces black and white photographs. This process works by using a 0.2 percent solution of silver nitrate dissolved in distilled water. The solution is used to spray on or saturate the paper. As one of the main components in perspiration is salt (sodium chloride), the application of the solution produces silver chloride only in the ridge areas of the fingerprint. The paper is then exposed to the light and the fingerprint turns black. Because other chlorides may also be present in the paper, the method was not always entirely successful and it is also now obsolete.

The 1970's brought a significant advance in the detection of fingerprints on paper. The discovery, however, was completely by accident. It seems a university scientist in the medical field was working on a process that

stains protein tissue sections a purple/red color. The scientist knocked over a bottle of fluid, a ninhydrin solution, on his notes. Since the solution was rapidly dissolving the notes, he quickly placed the papers in a laboratory oven set 10 or 20 degrees above the room temperature. When he removed the papers a few hours later, he not only found most of his notes intact, but dozens of purple/red fingerprints on the papers. When he consulted another scientist to see how to remove the fingerprints, the second scientist recognized the importance of the discovery. The two scientists jointly published a paper, which made the method known to fingerprint and document examiners.

It was David Crown of the Postal Inspection Laboratory who successfully developed a formula using ninhydrin, which preserved the ink and did not cause it to run. The formula suggested by Russell and Ralph Bradford in *"Introduction to Handwriting Examination and Identification"* consists of:

"Dissolve 3.5 grams ninhydrin in 20 milliliters methanol; add this to 1,000 milliliters petroleum ether. Shake well in a separatory funnel and let stand until the two layers separate. Drain off the bottom layer of methanol and discard. Use the top layer of petroleum ether and ninhydrin."

The ninhydrin solution is then either sprayed on the document or the document is submerged in the solution using a porcelain or glass tray (never metal). The document is then removed and placed on blotter or butcher paper for drying, which is accomplished very quickly at room temperature. The paper



should only remain in the solution long enough to saturate the entire document, as excessive wetting may cause the ink on the paper to dissolve. Some fingerprints will be developed upon drying. Placing the document between sheets of butcher paper and ironing over the top sheet with the iron set on the lowest setting may develop additional fingerprints. The fingerprints are then photographed for comparison by the fingerprint technician. The ninhydrin will tint the document a pale to medium rose/purple color which cannot be removed.

Special safety precautions should be taken when using a ninhydrin solution, as it is also toxic. It should be used only in a laboratory setting with proper ventilation and adequate filtration with the operator wearing a mask and gloves. A later discovery of mixtures of ninhydrin with the reagent Freon proved to be nontoxic, nonflammable, and odorless with remarkable non-ink-running capability. However, with the recent government-imposed restriction of Freon as an ozone-depletion chemical, its acquisition is difficult and in the future will be impossible.

Another accidental discovery was a major breakthrough for crime scene investigators and laboratory evidence examiners. A civilian forensic scientist working in the U.S. Army Crime Laboratory in Japan used Super Glue to repair a camera frame. When he checked on the camera later, he found white fingerprints all over the black camera's parts. As a forensic scientist, he recognized the importance of his discovery in fingerprint development. Now, surfaces that previously defied conventional methods were producing latent friction ridge impressions with the use of this product. The main ingredient in Super Glue is cyanoacrylate (CA), which combines with the

fingerprint when heated in a fuming tank. This method is highly successful on hard surfaces such as weapons, wood and plastic. The only paper type surfaces where this method will work are plastic bags, plastic tape or other slick surface type products such as Saran Wrap.

## References:

1. Bradford, Russell R. and Ralph Bradford., *Introduction to Handwriting Examination and Identification*, Nelson-Hall Publishers, Chicago, 1992
2. Fox, Richard H. and Carl L. Cunningham, *Crime Scene Search and Physical Evidence Handbook*, Paladin Press, Boulder, CO, 1992
3. Harrison, Wilson R., *Suspect Documents*, Nelson-Hall Publishers, Chicago, 1981
4. Hilton, Ordway, *Scientific Examination of Questioned Documents*, Callaghan 1956
5. Ragle, Larry, *Crime Scene*, Avon Books, New York, 1995
6. Robertson, Edna W., *Fundamentals of Document Examination*, Nelson-Hall Publishers, Chicago, 1991.

*Barbara Downer, BA, CDE, is a board certified document examiner with a BA in Psychology from the University of Central Oklahoma. She completed her questioned document certificate through the National Questioned Document Association as well as the questioned document section of the American Institute of Applied Science. Barbara currently serves on the Certification Board of NADE and was previously a member of the NADE Journal Editorial staff. Ms. Downer drew additional information for this article from her experience in developing fingerprints on documents in her previous employment as a Crime Scene Investigator for the Wichita Police Department.*



## CASE NOTES

### THERMAL PAPER CASE

by  
Kay Micklitz, CDE

A client called with the problem of restoring typed text on thermal paper. The text, which had been a draft of the mother's Last Will and Testament in 1998, had faded and was not legible.

In 1998, a copy of the draft of the will printed on thermal paper had been provided to each of four siblings, and the only daughter took the responsibility for typing and finalizing the mother's will. The daughter also took the mother to have the execution of the will notarized.

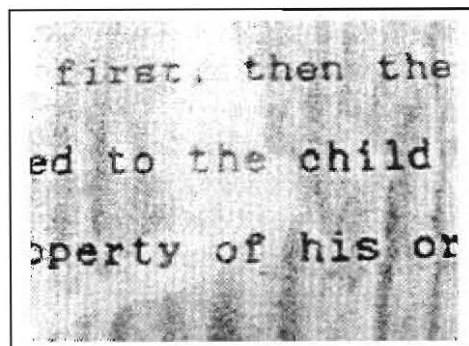
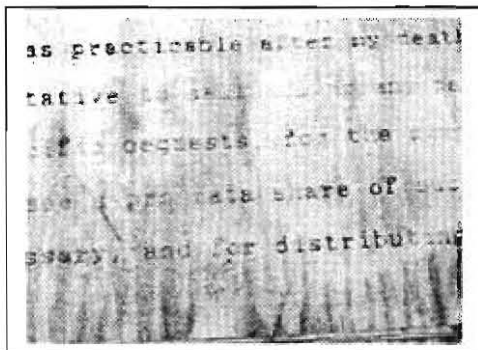
Two years later, after the death of the mother at age 89, the daughter presented an alleged original of the mother's Last Will and Testament that had been signed and each page initialed and notarized. This Last Will and Testament bequeathed the entire estate and assets to the only daughter.

One of the siblings presented his thermal paper draft of the will for examination in hopes of

restoring the faded text. As an experiment, a photocopier was set on the darkest setting and heavy, black paper was placed behind each page of the thermal paper, and a photocopy was made. The text of the photocopied pages of the thermal paper original draft of the will became legible and easily readable as shown in the illustrations of the restored text below.

A comparison of the text from the photocopied thermal paper draft of the will was then made with the text of the alleged original. The comparison revealed that all the siblings' names had been eliminated from the alleged original will and only the daughter's name remained as sole beneficiary, giving the entire estate and all its assets to the daughter.

*Kay Micklitz, CDE, BCFE, is a board certified document examiner. She holds a paralegal certificate from the University of Texas, San Antonio and has an extensive background in civil litigation. Kay joined NADE in 1994 and earned her CDE in 1997. She completed studies through the National Questioned Document Association and the American Institute of Applied Science for Questioned Documents and Police Photography. Kay is a licensed instructor for the Texas police officers and private investigators. She is court qualified and has been appointed by federal, state and county courts to examine documents.*





## CASE NOTES

### A "DAVID AND GOLIATH" CASE

by  
R. Joseph Jalbert

All questioned signatures vary in complexity. Acquiring sufficient reliable and comparable standards to give a strong opinion is often a stumbling block. In 1979 an attorney asked a document examiner if it would be possible to represent an elderly client who had little money. The attorney was working gratis on this case and wanted the document examiner to do the same. The document examiner would not work gratis but would work on the case at a sharply reduced fee the client could afford.

An insurance company claimed the client signed an amendment application to his insurance policy in 1953. The amendment stated the client would receive a small amount of money each month. In return, the face value of the policy at term, after 40 years of paying premiums, would be zero.

The trial was to take place in two weeks. Exemplars of the same form as the questioned were needed before and after 1953. Fortunately, the attorney was able to provide twelve exemplars of the type and from the timeframe that the document examiner required. One was a WWII discharge paper from 1944, and the remaining exemplars were from 1944 to 1979. All twelve were original documents. The disputed amendment to the insurance policy was a copy.

Handwriting comparison sheets were prepared

- one for every two jurors, the judge, each attorney, and one for the document examiner to explain his opinion from the witness box. The reason the document examiner provided one handwriting comparison sheet for every two jurors was to reduce the impact of someone with "form blindness". *Questioned Documents* by Albert Osborn addresses "form blindness" and gives an illustration on page 248. With two jurors sharing a comparison sheet, it is more likely that one juror would assist another to see something that could not be seen due to "form blindness."

At trial, during cross-examination, the opposing attorney asked, "Isn't it obvious, looking at your handwriting comparison sheet, that the person who wrote George Dape under the Standards of Comparison is NOT the same person who wrote George Dape on the questioned application for Amendment to the Life Insurance Policy?" This seems like a "gift" question from the attorney because it basically admits to the truth of the examiner's opinion, but it is never wise to accept such a gift too quickly. The answer from the examiner was, "No it is not obvious to everyone because of a condition called 'form blindness.'" The examiner went on to explain that some people exhibit form blindness and can not recognize similarities and differences in shapes of letters.

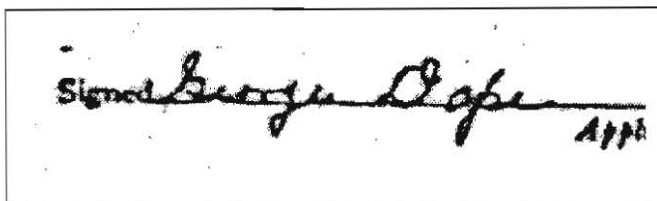
The handwriting comparison sheet showed that George Dape's signature had not changed in 35 years. The size, tie strokes in the G, double peak of the G, open e, open lower case g, elliptically shaped upper tie ending stroke of the D, and floating of the signature above the base line all were illustrated in the exemplars.



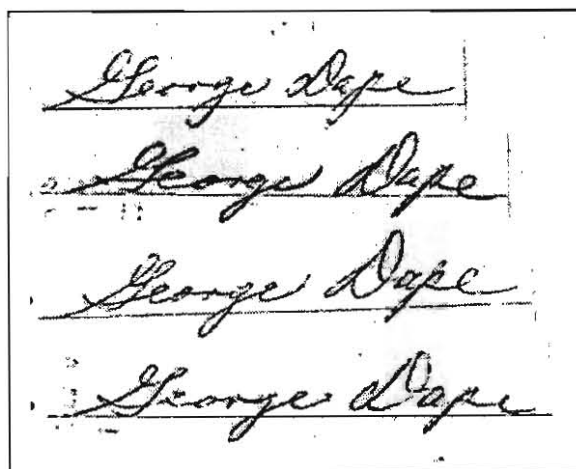
Such was not the case in the small George Dape signature on the amendment application.

The document examiner was excused after giving testimony. Later that evening, the client called to thank him because they won the case and this meant a lot to his wife and himself. They had little money and were counting on the insurance policy to help them get by. The document examiner has completed many hundreds of cases since then, but this case is the one that means the most to him. It was a David and Goliath case. He worked for David.

*R. Joseph Jalbert received his initial training in handwriting analysis from IGAS, and studied for three years under a court qualified document examiner in Rochester, New York. He's been working in document examination for the past 30 years. He's a past President of the Upstate New York Chapter of the International Association for Identification and is a member of NADE. He's a graduate of Lowell Technological Institute and is in private practice in Rome, New York  
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*Illustration 1 - The questioned signature*



*Illustration 2 – Some of the known signatures*



## Forensically Speaking

+ Although many people joke about the illegible "doctor's handwriting" that forensic document examiners recognize as thread, it is no laughing matter. We know that the purpose of writing is to communicate. When one writes so that the message cannot be deciphered accurately, there is a lack of communication, albeit unintentional.

In 1999 a study was undertaken in Atlantic City, NJ, by the Institute of Medicine (a part of National Academy of Sciences). The results were astounding and horrifying. Poor handwriting caused misinterpretation of prescriptions that resulted in many deaths.

Hospital officials decided to put a plan into action to stop affecting patients' well being. They arranged a seminar in which handwriting experts taught an italic type of writing, basically bare bones in nature, to hospital personnel. They cut away all curlicues and elaboration, and encouraged more directness in the strokes.

It should be noted that The American Medical Association also admonished physicians about their poor handwriting telling them to either improve their writing skills or start using printscript.

-Reference: Philadelphia Inquirer, October 4, 2000 by Jacqueline L. Uργο.

+ In Judaism the Torah (comprising the first five books of the Bible) is handwritten by a sofer or professional scribe. Not only must a sofer understand the religious magnitude of the individual letters and words, but he must know the prescribed Talmudic laws that govern the

entire process from the ritual preparation of the parchment for the scroll from the skin of a kosher animal, to the selection of the ink and quill. It is said that a sofer spends at least a year writing approximately a quarter million letters.

-Reference: Melinda Hofstetter of Fairfax, Virginia in a letter to the editor of Smithsonian.

+ Kakemono is a vertical Japanese scroll bearing text.

+ Kanji is a Japanese system of writing using characters derived from the Chinese.

+ Super graffiti is known as "scratchiti." It cannot be painted over or power-washed away. Why? It is etched into glass and plexiglas instead of being spray-painted on walls. Glass can be etched by many ordinary objects (diamond rings, knives, nails, keys). Vandals also use etching chemicals in their scratchiti, and have now hit Northeast Philadelphia, putting scratchiti on bus shelters, store windows, schools, etc.

The worst aspect of scratchiti is its permanence. In order to remove it, windows have to be replaced, often at great expense. Police add that criminal charges could become felonies because of the high cost of damages.

- Reference: Far Northeast Times Newsweekly, Wednesday, December 13, 2000, pp. 1, 38.

+ There is an article of interest to handwriting experts in the December 2000 issue of SMITHSONIAN magazine. "Inscribing the



Word," was written by Per Ola and Emily D'Aulaire. It tells how, at a scriptorium in Wales, calligraphers are using goose, swan and turkey quills, vellum and gold leaf, color cakes and other pigments, gesso, hematite burnishers, ivory pointers, etc. to create a handwritten Bible applicable to modern times but in the style of medieval art. Such an undertaking has never been attempted since medieval scribes did such work in monasteries.

The painstaking work is being spearheaded by Donald Jackson, the foremost calligrapher in the Western world. Among his credits are his position as scribe to Queen Elizabeth's Crown Office at the House of Lords and leader of calligraphy conferences at St. John's University in Minnesota.

Jackson, using and modifying computer fonts, had to create a new script for this work. Illuminations and marginalia will be included, but they, too, will be modern. Although ancient techniques are used to create this masterpiece, the language will be English.

The photographer for this article was Michael Freeman. His photographs, showing various phases of the calligraphers at work, are art in themselves.

-Reference: SMITHSONIAN magazine, December 2000, Volume 31, No. 9, pp 79 - 88.

+ Most of us have toner cartridges for copiers and printers. They should be stored horizontally, out of direct sunlight, below 30 degreesC/86 degrees F, and at a humidity of less than 85%.

+ Unused copy paper sheets should be sealed in their original wrapper to protect them from moisture and stored in a cool, dry location. Store copy paper flat, do not stack the packages on end.

+ Hot, humid or cold locations, or areas near water taps, heaters, humidifiers, etc., can adversely affect copiers. So can dusty locations, locations where ammonia gas is generated, or poorly ventilated areas. Avoid extreme temperature variations. Rapid heating of a room may cause condensation in a copier with subsequent malfunctions. Keep copiers away from flames or flammable substances. Do not house your copier where constant vibrations occur or on uneven surfaces.

+ 2,300 years ago the mathematician Archimedes wrote a 174-page treatise, "On Floating Bodies." Scholars believe that in the 10<sup>th</sup> century a scribe made a copy of this treatise and that about 200 years later that parchment was erased by a monk who reused it to inscribe a prayer book. A twice used parchment is known as a palimpsest. When this recycling took place in the 12<sup>th</sup> century, parchment was expensive and the works of Archimedes were not in demand.

Now, in the 21<sup>st</sup> century, scientists from Johns Hopkins University and the Rochester Institute of Technology are using digital cameras and processing along with UV and IR techniques to reveal the hidden text. Five pages have been completed and the team hopes to complete the project this year.

-Reference: The Associated Press



### A Mental Exercise

The following exercise and much of the material for this column, was submitted by Phil Cook , CDE, Dipl. Phil found this through the Internet, and no additional source is known. This is presented as a way to experience some of the complex workings of your own brain.

Look at the chart and say the COLOUR not the word

<b>YELLOW</b>	<b>BLUE</b>	<b>ORANGE</b>
<b>BLACK</b>	<b>RED</b>	<b>GREEN</b>
<b>PURPLE</b>	<b>YELLOW</b>	<b>RED</b>
<b>ORANGE</b>	<b>GREEN</b>	<b>BLACK</b>
<b>BLUE</b>	<b>RED</b>	<b>PURPLE</b>
<b>GREEN</b>	<b>BLUE</b>	<b>ORANGE</b>

#### Left – Right Conflict

**Your right brain tries to say the colour but  
your left brain insists on reading the word.**



## Submission Guidelines

### Types of Papers Accepted:

1. **Research** papers report original, primary research in any area of QDE.
2. State of the Art Reviews survey the published literature on a specific topic in the field of QDE.
3. Case Notes present one particular aspect of a QDE case which is no longer subject to litigation or confidentiality. It is the responsibility of the author to obtain any required permission for use of material submitted. Should any litigation arise from improper use of materials, the liability belongs to the individual author, not to NADE.
4. Technical Notes discuss a single topic regarding equipment or methodology.
5. Letters to the Editor offer brief, specific comment on a current issue or on a paper previously published in the Journal.
6. OpEd (Opinion/Education) pieces set forth an opinion, pose a question, or inform about some aspect of QDE.

All papers must include references to support assertions and must present some information or viewpoint regarding some aspect of QDE which would be of value to readers.

The Editorial Board has avoided setting rigid guidelines for style and format. For example, both endnotes and footnotes are acceptable; bibliographic citations may follow standard sociological practice or legal practice, or other acceptable practice.

Authors may in general follow any standard style manual. That published by the U.S. Government Printing Office is recommended, since it is regularly

up-dated and readily available. Papers should, however, have these features:

### Method of Submitting Papers:

1. Send four (4) printed copies and one (1) 3.5" diskette with either an ascii file, text file, Microsoft Word file, or Word Perfect file of the paper to Emily Will, Editor. Alternatively, submissions may be sent via email to [qdewill@mindspring.com](mailto:qdewill@mindspring.com). It is preferable to receive the articles in Times New Roman font, 12 pitch.
2. As part of the above, submit one camera-ready print copy or electronic file of each exhibit or illustration you intend to have in this paper. If you desire to submit illustrations electronically, contact the editor in advance to discuss format. Each illustration should have a figure number by which it is referred to in the paper, and a caption or text which succinctly identifies it and states its purpose.
3. Deadlines for the next two issues are July 1, 2002 and January 1, 2003.
4. It is highly recommended that you begin the process of writing your paper by discussing the potential for publication with one of the editors via email, telephone or letter. Contact information can be found at the front of the journal. This discussion will take the place of submission of an abstract.

### Style and Format:

1. Title of the paper centered at top
2. Name(s) of author, and if multiple, the one(s) who will deal with the Editorial Board should be clearly indicated.
3. A brief professional bio of the author including degrees, certifications and relevant professional information.



4. The paper should have clearly demarcated sections. There are no rigid requirements in this regard, only that it should be logically developed and helpful to the reader.

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